2811

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No.: NIEDERNOSTHEIDE

In re Application of:	
FRANZ JOSEF NIEDERNOSTHEIDE et al.	
Int. Appl. No.: PCT/DE00/03351	
Int. Filing Date: September 26, 2000	
For: THYRISTOR WITH VOLTAGE SURGE LOADABILITY IN THE RECOVERY TIME	

INFORMATION DISCLOSURE STATEMENT

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, on **September 19, 2002** (Date)

Henry M. Feiereisen (Name of Registered Representative)

Signature — Date of Signature: 9/19/2002

Commissioner for Patents
Washington, D.C. 20231

S I R:

In accordance with 37 C.F.R. 1.56, applicant wishes to call the attention of the Examiner to the following references A) to E) which were cited in the International Search Report issued by the European Patent Office with regard to the corresponding International patent application No. PCT/DE00/03351 and/or were cited in the instant specification. Applicant also wishes to call the attention of the Examiner to references F) to O). Applicant does not admit that any of the cited documents constitutes prior art against the pending application.

	Country:	Patent or Appl. No:	Patentee or Applicant:	Issue or Filing Date:
A)	International	PCT/DE97/02237	Ruff et al.	04-09-1998
B)	International	PCT/DE98/00248	Schulze	08-06-1998
C)	Mitlehner et al.: "High Voltage Thyristor for HDVC ..."			04-11-1998
D)	Europe	EP 0 714b139 A1	Bernier	05-29-1996
E)	Schulze et al.: "Light Triggered 8kV Thyristor ..."			1996
F)	Germany	DE 196 50 762 A1	Eupec GmbH	07-02-1998
G)	Europe	0 100 136	Ogura	02-08-1984
H)	Europe	0 062 100	Herbert	10-13-1982
I)	Europe	0 564 007 A1	Schulze et al.	10-06-1993
J)	International	PCT/DE92/00191	Schulze et al.	10-15-1992
K)	Germany	DE 38 37 747 C2	Schulze	07-17-1997
L)	USA	5,028,974	Kitagawa et al.	02-07-1991
M)	USA	4,195,306	Füllmann et al.	03-25-1980
N)	Peter Voss: "A Thyristor Protected Against di/dt-Failure ..."			09-10-1973
O)	Japan	61-202465	Yotsudo	09-08-1986

Copies of these references are submitted herewith along with form PTO-1449. The Examiner is requested to initial the attached form PTO-1449 and to return a copy of the initialed document to the undersigned as an indication that the attached references have been considered and made of record.

[ ] This Information Disclosure Statement is filed within three months of the filing date of a national application other than a continued prosecution application under 1.53(d), so that no fee under 37 C.F.R. §1.97 is due.

[ ] This Information Disclosure Statement is filed within three months of the date of entry of the national stage as set forth in 1.491 in an international application, so that no fee under 37 C.F.R. §1.97 is due.

[X] This Information Disclosure Statement is filed before the mailing of a first Office Action on the merits, so that no fee under 37 C.F.R. §1.97 is due.

[ ] This Information Disclosure Statement is filed before the mailing of a first Office Action after the filing of a request for continued examination under §1.114, so that no fee under 37 C.F.R. §1.97 is due.

[ ] This Information Disclosure Statement is filed after the issuance of a first office but before issuance of a final action under §1.113, or a notice of allowance under §1.311.

[ ] This Information Disclosure Statement is submitted after the mailing of a final action or a notice of allowance, but before payment of the issue fee.

[ ] The undersigned submits the following statement requesting consideration of this statement:

The undersigned hereby states:

[ ] That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement;

[ ] That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in §1.56(c) more than three months prior to the filing of the information disclosure statement.

[ ] The fee of $180.00 set forth in 1.17(p).

[ ] The Commissioner is hereby authorized to charge the fee as set forth in 1.17(p), and any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0502.

[ ] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0502.

In order to satisfy the requirement under 37 C.F.R. §1.98(a)(3) for a concise explanation of the relevance of each item of information, applicant herewith submits a copy of the International Search Report together with a translation of the relevant pages thereof. In addition, applicant notes with respect to any information that is not in English language as follows:

Reference F) describes a thyristor having a semiconductor body with an anode-side base zone of the first conductivity type and one or more cathode-side base zones of the opposite, second conductivity type. Anode-side and cathode-side emitter zones are provided, and at least one region in the cathode-side base zone whose geometry gives it a reduced breakdown voltage as compared with the remaining regions in the cathode-side base zone and the edge of the semiconductor body. At the anode, below the region of reduced breakdown voltage, the thyristor has at least one recombination zone in which the free charge carriers have a reduced lifetime.

Reference H) describes a thyristor having an n-emitter provided with a cathode, a p-emitter provided with an anode, and two base layers respectively adjacent thereto. Further, an auxiliary emitter serves the purpose of internal

current gain. High ignition sensitivity is strived for in addition to good stability. To this end, a connectible auxiliary emitter is provided next to the auxiliary emitter, forming a three-layer structure together with the base layers with a higher current transfer ratio for the charge carriers emitted by it than the auxiliary emitter. In order to produce a high ignition sensitivity, the connectible auxiliary emitter is conductively connected to the auxiliary emitter via a semiconductor switch. The area of employment comprises trigger-sensitive thyristors with high di/dt and dU/dt stability.

Reference I) describes a thyristor with an npnp sequence of layers, in which the p-type emitter (4) exhibits in the lateral area of a firing contact (8) or of a light-sensitive zone (17a) a part-area (15) which is provided with a higher doping concentration and the remaining part of the p-type emitter (4) and in which exists an area (16) of the thyristor, which is located underneath the firing contact (8) or the light-sensitive thyristor zone (17a) and is irradiated with electrons or protons. The result is that a controllable break-over firing of the thyristor occurs at an adjustable reduced break-over voltage.

Reference K) describes a semiconductor switch having a main thyristor and a separate auxiliary thyristor (1 and 2) which can be fired by light pulses and in which, on the one hand, the n-type base layer (11) of the auxiliary thyristor (2) is considerably less strongly doped and has a substantially greater layer thickness than the n-type base layer (5) of the main thyristor (1), and in which, on the other hand, a photosensitive gate pattern (21a, 22a) is implemented, which is integrated into the auxiliary thyristor (2) and has substantially greater lateral dimensions than

in a conventional auxiliary thyristor. By these two measures, the firing sensitivity is increased, without the dU/dt behaviour of the auxiliary thyristor deteriorating. Instead of enlarging the layer thickness of the n-type base layer (11) it is also worth considering incorporating an n<+>-type stop zone (47).

The above-identified application discloses and claims an invention patentable over this prior art.

Entry of the references above set forth into the file of the above application is believed to be in order and is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0502.

Respectfully submitted

By: _____
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Form PTO-1449

U.S. Department of Commerce
Patent and Trademark Office

INFORMATION DISCLOSURE CITATION

Attorney's Docket No.	Applicant	Appl. No.
NIEDERNOSTHEIDE	NIEDERNOSTHEIDE ET AL.	10/089,590
Filing Date	**Group**	**Examiner**
April 5, 2002	2811	

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date, if appropriate
	5,028,974	07-02-1991	Kitagawa et al.			
	4,195,306	03-25-1980	Füllmann et al.			

FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation
	PCT/DE97/02237	04-09-1998	International			
	PCT/DE98/00248	08-06-1998	International			
	EP 0714139A1	05-29-1996	Europe			
	DE 19650762A1	07-02-1998	Germany			
	EP 0100136	02-08-1984	Europe			
	EP 0062100	10-13-1982	Europe			
	EP 0564007A1	10-06-1993	Europe			
	PCT/DE92/00191	10-15-1992	International			
	DE 3837747C2	07-17-1997	Germany			
	JP 61-202465	08-09-1886	Japan			

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		H. Mitlehner: "High Voltage Thyristor for HVDC Transmission and Static Var Compensators", IEEE 1998
		Schulze et al.: "Light Triggered 8kV Thyristor with a New Type of Integrated Breakover Diode", PCIM 1996, Nürnberg, Germany
		P. Voss: "A Thyristor Protected Against di/dt-Failure at Breakover Turn-On", in: Solid State Electronics 1974, Vol. 17, pp. 655-661

Examiner:	**Date considered:**

*Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.